What is claimed is:

1. An angle sensor, comprising:

a reduction mechanism that reduces a rotation transmitted from a rotation axis;

a variable inductance mechanism that changes an inductance according to a rotation angle of a reduced axis of said reduction mechanism;

a detection coil that detects the change of inductance; and

a circuit that detects the angle of said rotation axis from the output of said detection coil.

2. The angle sensor according to claim **1**, wherein:

the change of inductance in said variable inductance mechanism is maximum near a rotation angle of zero in the reduced axis.

3. The angle sensor according to claim **1**, wherein:

said reduction mechanism is a planetary gear unit including a sun gear, a planet gear and a ring gear.

4. The angle sensor according to claim **1**, wherein:

said reduction mechanism has a reduction ratio of 1/4 to 1/10.

5. An angle sensor, comprising:

a rotation axis;

a magnetic body that rotates according to the rotation of said rotation axis;

a coil that generates a flux in a magnetic path including said magnetic body;

a magnetic sensing element that detects the flux which changes according to the rotation of said rotation axis; and

a detection circuit that detects the rotation angle of said rotation axis by using the output of said magnetic sensing element according to the change of flux.

6. An angle sensor, comprising:

a rotation axis;

a magnetic body that includes a tooth portion and rotates according to the rotation of said rotation axis;

a coil that generates a flux in a magnetic path including said magnetic body;

a plurality of magnetic sensing elements that detect a change in flux according to the rotation of said rotation axis in said magnetic path and output alternating signals with different phases from each other; and

a detection circuit that detects the rotation angle of said rotation axis by using the alternating signals;

wherein said tooth portion of said magnetic body is capable of moving relatively to said magnetic sensing elements and rotates according to said rotation axis.

7. The angle sensor according to claim **6**, wherein:

said magnetic sensing elements each have a length of approximately half the width of protrusion or groove of said tooth portion, and

said detection circuit is a bridge circuit that uses at least two of said magnetic sensing elements and output alternating signals with different phases from each other.

8. An angle sensor, comprising:

first and second rotation axes disposed on the same axis;

a first magnetic body that rotates according to the rotation of said first rotation axis;

a second magnetic body that rotates according to the rotation of said second rotation axis;

a coil that generates a flux in a magnetic path including said first and second magnetic bodies;

a first magnetic sensing element that detects the flux which changes according to the rotation of said first rotation axis;

a second magnetic sensing element that detects a flux which changes according to the rotation of said second rotation axis; and

first and second detection circuits that detect the rotation angle of said first and second rotation axes by using the output of said first and second magnetic sensing elements according to the change of flux.

9. An angle-torque sensor according to claim **8**, further comprising:

a torsion bar that connects between said first and second rotation axes and is twisted by a torque generated between said first and second rotation; and

a torque detection circuit that detects said torque from a difference between the rotation angles detected by said first and

second detection circuits.

10. An angle sensor, comprising:

a rotation axis;

a magnetic body that rotates according to the rotation of said rotation axis;

a coil that generates a flux in a magnetic path including said magnetic body;

a plurality of magnetic sensing elements that detect the flux which changes according to the rotation of said rotation axis; and

a detection circuit that detects the rotation angle of said rotation axis by using the output of said magnetic sensing elements according to the change of flux;

wherein at least one of said plurality of magnetic sensing elements includes a mechanism that rotates being reduced or increased of its speed according to the rotation of said rotation axis.

11. An angle sensor, comprising:

a rotation axis;

a first magnetic body that rotates with said rotation axis;

a second magnetic body that rotates reducing or increasing the speed of said rotation axis;

a coil that generates a flux in a magnetic path formed by said first and second magnetic bodies;

a first magnetic sensing element that detects the flux which changes according to the rotation of said first magnetic sensing element;

a second magnetic sensing element that detects a flux which changes according to the rotation of said second magnetic sensing element; and

a detection circuit that detect the rotation angle of said rotation axis from a difference between the outputs of said first and second magnetic sensing elements according to the change of flux.

12. An angle-torque sensor, comprising:

a torque detection coil that detects a change in state quantity in a mechanism to detect a relative angle made between input axis and output axis of a torsion bar to be twisted by a torque;

an angle detection coil that detects a change in state quantity in a mechanism to detect a rotation angle of a reduction axis which rotates with a rotation being transmitted from said input axis or output axis and being reduced by a reduction mechanism;

a torque detection circuit that detects the relative angle from the output of said torque detection coil; and

an angle detection circuit that detects the rotation angle from the output of said angle detection coil.

13. The angle-torque sensor according to claim **12**, wherein:

said reduction mechanism is a planetary gear unit including a sun gear, a planet gear and a ring gear.

14. The angle-torque sensor according to claim **12**, wherein:

said reduction mechanism has a reduction ratio of 1/4 to 1/10.

15. The angle-torque sensor according to claim **12**, wherein:

said torque detection coil and said angle detection coil have the same shape.

16. The angle-torque sensor according to claim **12**, further comprising:

a compensation means for compensating one or both of the output of said torque detection coil and the output of said angle detection coil.

17. The angle-torque sensor according to claim **12**, wherein:

said torque detection coil includes first and second detection coils,

said angle detection coil includes third and fourth detection coils,

said torque detection circuit detects the torque by detecting the relative angle from a difference between the outputs of said first and second detection coils,

said angle detection circuit detects the rotation angle from a difference between the outputs of said third and fourth detection coils, and

said first to fourth detection coils are disposed on the same axis.

18. The angle-torque sensor according to claim **16**, wherein:

said compensation means includes a compensation coil that detects a state quantity determined by a mechanism which gives a compensation signal to compensate the output of said torque

detection coil and said angle detection coil, and a compensation circuit that generates the compensating signal from the output of said compensation coil.

19. The angle-torque sensor according to claim **16**, wherein:

said torque detection coil includes first and second detection coils,

said torque detection circuit detects the torque from a difference between the outputs of said first and second detection coils, and

said compensation means is a compensation circuit that generates a compensation signal from an average of the outputs of said first and second detection coils to compensate the output of said angle detection coil.

20. The angle-torque sensor according to claim **18**, wherein:

said torque detection coil detects a change in inductance that changes according to a relative angle between a detection ring disposed on said input axis and a detection ring disposed on said output axis,

said compensation coil detects an inductance determined by a compensating ring being fixed and the detection ring of said input axis or said output axis, and

said angle detection coil detects a change in inductance that changes according to a relative angle between a reduction axis detection ring being disposed on said reduction axis and said compensation ring.

21. The angle-torque sensor according to claim **18**, wherein:

said torque detection coil detects a change in inductance that changes according to a relative angle between a detection ring disposed on said input axis and a detection ring disposed on said output axis,

said compensation coil detects an inductance determined by a compensating ring, and

said angle detection coil detects a change in inductance that changes according to a relative angle between a reduction axis detection ring being disposed on said reduction axis and a fixed ring.

22. The angle-torque sensor according to claim **19**, wherein:

said first and second detection coils detect a change in inductance that changes according to a relative angle between a detection ring disposed on said input axis and a detection ring disposed on said output axis, and

said angle detection coil detects a change in inductance that changes according to a relative angle between a reduction axis detection ring being disposed on said reduction axis and a fixed ring.

23. An angle-torque sensor, comprising:

first and second rotation axes that are connected to a torsion bar to be twisted by a torque;

a first magnetic body that rotates with said first rotation axis;

a second magnetic body that rotates with said second rotation

axis;

a torque detection coil that generates a flux in a magnetic path including said first and second magnetic bodies;

a torque detection circuit that detects the output voltage of said torque detection coil which changes according to a relative position between said first and second magnetic bodies;

a third magnetic body that rotates according to the rotation of said second rotation axis;

a compensation coil that generates a flux in a magnetic path including said second and third magnetic bodies;

a compensation circuit that corrects the output of said torque detection circuit by using the output voltage of said compensation coil;

a first magnetic sensing element that detects a flux which changes according to the rotation of said third magnetic body; and

a first angle detection part that detects the rotation angle of said third magnetic body from the output of said first magnetic sensing element according to the change in flux.

24. An angle-torque sensor according to claim **23**, further comprising:

a second magnetic sensing element that detects a flux of said compensation coil which changes according to the rotation of said second magnetic body; and

a second angle detection part that detects the rotation angle of said second rotation axis from the output of said second magnetic sensing element

25. An angle-torque sensor, comprising:

first and second rotation axes that are connected to a torsion bar to be twisted by a torque;

a first magnetic body that rotates with said first rotation axis;

a nonmagnetic body that rotates with said second rotation axis;

a torque detection coil that generates a flux in a magnetic path formed by said first magnetic body and being shielded by said nonmagnetic body;

a torque detection circuit that detects the output voltage of said torque detection coil which changes according to a relative position between said first magnetic body and said nonmagnetic body;

a second magnetic body that rotates with said first or second rotation axis;

a compensation coil that generates a flux to said second magnetic body;

a compensation circuit that corrects the output of said torque detection circuit by using the output voltage of said compensation coil;

a magnetic sensing element that detects a flux of said second magnetic body which changes according to the rotation of said first or second magnetic body; and

an angle detection part that detects the rotation angle of said first or second magnetic body from the output of said magnetic sensing element according to the change in flux.

26. An electric power steering unit, comprising:

a motor that drives a steering rotation axis;

a steering sensor that includes: a torque detection coil that is disposed on said rotation axis and detects a change in state quantity in a mechanism to detect a steering angle from a relative angle made between input axis and output axis of a torsion bar to be twisted by the steering torque; an angle detection coil that detects a change in state quantity in a mechanism to detect a steering angle from a rotation being transmitted from said input axis or output axis and being reduced by a reduction mechanism; a torque detection circuit that detects the steering torque by detecting the relative angle from the output of said torque detection coil; and an angle detection circuit that detects the steering angle from the output of said angle detection coil; and

a controller that controls said motor based on the steering torque and steering angle to be detected by said steering sensor.

27. The electric power steering unit according to claim **26**, wherein:

said steering sensor further includes a compensation means that compensates one or both of the output of said torque detection coil and the output of said angle detection coil.

28. The electric power steering unit according to claim **26**, wherein:

said torque detection coil includes first and second detection coils,

said angle detection coil includes third and fourth detection coils,

said torque detection circuit detects the steering torque by detecting the relative angle from a difference between the outputs

of said first and second detection coils,

said angle detection circuit detects the steering angle from a difference between the outputs of said third and fourth detection coils, and

said first to fourth detection coils are disposed on the same axis.

29. The electric power steering unit according to claim **27**, wherein:

said compensation means includes a compensation coil that detects a state quantity determined by a mechanism which gives a compensation signal to compensate the output of said torque detection coil and said angle detection coil, and a compensation circuit that generates the compensating signal from the output of said compensation coil, and

said controller controls said motor based on the steering torque and steering angle to be corrected by said compensation means.

30. The electric power steering unit according to claim **27**, wherein:

said torque detection coil includes first and second detection coils,

said torque detection circuit detects the steering torque from a difference between the outputs of said first and second detection coils,

said compensation means is a compensation circuit that generates a compensation signal from an average of the outputs of said first and second detection coils to compensate the output of said angle detection coil, and

said controller controls said motor based on the steering torque and the steering angle to be corrected by said compensation means.

31. An electric power steering unit, comprising:

a steering sensor that includes: a first and second rotation axes that are connected to a torsion bar to be twisted by a steering torque; a first magnetic body that rotates with said first rotation axis; a second magnetic body that rotates with said second rotation axis; a torque detection coil that generates a flux in a magnetic path including said first and second magnetic bodies; a torque detection circuit that detects the output voltage of said torque detection coil which changes according to a relative position between said first and second magnetic bodies; a third magnetic body that rotates according to the rotation of said second rotation axis; a compensation coil that generates a flux in a magnetic path including said second and third magnetic bodies; a compensation circuit that corrects the output of said torque detection circuit by using the output voltage of said compensation coil; a first magnetic sensing element that detects a flux which changes according to the rotation of said third magnetic body; and a first angle detection part that detects the rotation angle of said third magnetic body from the output of said first magnetic sensing element according to the change in flux; and

a motor that drives a steering rotation axis;

wherein the torque of said motor is controlled by using said steering torque and steering angle detected by said steering sensor.